

## **REMARKS**

Claims 1-3, 5, 7-8, 11-13, 15, 20 and 24 are amended, claims 6 and 9-10 are cancelled and new claims 25-27 are added. No new matter is being presented.

### **Objections to Claims 9 and 24**

Claim 9 is objected to under 37 CFR 1.75 (c), as being of improper dependent form. Claim 9 is canceled and thus obviates the objection.

Claim 25 is objected to for incorrectly stating it is dependent on claim 14. In response, claim 25 has been amended to depend from claim 15.

### **Double Patenting Rejection of Claims 1-14**

Claims 1-14 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-3, 7 and 11-15 of co-pending Application No. 11/884,012. In response, Applicants concurrently submit a terminal disclaimer.

### **35 U.S.C. § 112 Rejection of Claims 5-7, 9, 13 and 20-21**

Claims 5, 6, 7, 9, 13 and 20-21 stand rejected under 35 U.S.C. § 112, second paragraph for failing to particularly point out and distinctly claim the subject matter which Applicants regard as the invention. Specifically, claims 5 and 9 have been rejected as not being clear regarding where the “subsequent step of flotation” occurs. Generally, a cavitation reactor is a separate apparatus from a flotation unit and the subsequent step may be performed in a separate unit. However, deinking and the subsequent step of flotation may also be performed in a single apparatus (see specification at ¶ [0025]).

With respect to claims 6, 7 and 13, the Examiner rejected these claims as not clearly stating whether the pressures are “absolute” or “gauge.” With respect to claims 7 and 13, such pressures are on gauge pressures. For example, with respect to claim 7, if 0.01 Mpa were absolute pressure, it would be below atmospheric pressure, and make it impossible to run a pulp suspension through a pipe. With respect to new claim 27 which is based on cancelled claim 6, the pressures are gauge pressures.

Claim 20 has been amended to correct the insufficient antecedent basis issue and now both claims 20 and 21 particularly point out and distinctly claim the subject matter which Applicants regard as their invention.

#### **35 U.S.C. § 102/103 Rejection of Claim 10**

Claim 10 has been rejected under 35 U.S.C. § 102 (b) as anticipated by or, in the alternative, under 35 U.S.C. § 103(a) as obvious over “Handbook for Pulp and Paper Technologist” by Smook (hereinafter “Smook”). However, claim 10 has been cancelled thus obviating this rejection.

#### **35 U.S.C. § 103 Rejection of Claims 1-7, 9 and 10-14**

Claims 1-7, 9 and 10-14 are rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 3,834,982 to Solonitsyn et al. (hereinafter “Solonitsyn”), in view of Soviet patent document SU 720085 to Pilipenko et al. (hereinafter “Pilipenko”), as evidenced by Smook. Claims 9-10 are cancelled by this amendment.

The Office Action indicates that Solonitsyn discloses “a method for treating pulp using cavitation which delaminates and fiberates fibers using a fluid jet.” (Action, p. 6). Additionally, Solonitsyn is cited for disclosing bubbles generated by cavitation that contact the pulp suspension to strip contaminants.

However, Solonitsyn does not disclose external application of bubbles to fiber surfaces. Solonitsyn discloses bubbles or cavitation cores as pockets of air that are “**present in the micro-macro-, submicropores and capillaries of the fibres** [of the material being treated].” (Col. 8, lines 28-29, emphasis added). Solonitsyn specifically states that these cavitation cores or bubbles are “located directly within the fibres.” (Col. 9, lines 7-8).

In contrast, Applicants’ method as recited in independent claims 1, 5, 11 and 12 utilizes bubbles generated by cavitation using a fluid jet to contact the surfaces of fibers and strip contaminants (see Para. bridging pages 29-20 of the present specification). These fine bubbles have a diameter of approximately 1µm to 1mm. The bubbles collapse on the pulp fiber surfaces, the impact force arriving at pulp fiber surfaces via water and becomes absorbed into an amorphous region of cellulose forming pulp fibers, thereby promoting external fibrillation and swelling of pulp fibers and at the same time stripping substances deposited on the pulp fiber surfaces. Accordingly, Solonitsyn neither discloses nor suggests the use of bubbles applied to fiber surfaces.

Furthermore, Solonitsyn utilizes cavitation forces generated by a cylindrical solid body in the hydrodynamic flow of suspension so as to cause a two-dimensional plane contraction of the flow to produce cavitation forces. Thus, bubbles are not produced. In contrast, the present invention as recited in the independent claims strips contaminants with bubbles generated by use of a liquid jet. Accordingly, the rejection of claims 1, 5, 11 and 12 should be withdrawn.

Pilipenko and Smook do not disclose use of bubbles applied externally to fibers by a fluid jet, but are cited for disclosing various features/steps and thus fail to cure the basic deficiencies of Solonitsyn. Independent claims 1, 5, 11 and 12 are believed to be patentably distinct over Solonitsyn, Pilipenko and Smook either alone or in combination. With respect

to dependent claims 2-4, 6-7 and 13, such claims are ultimately dependent on independent claims 1 and 11, respectively, and are patentably distinct for the same reasons.

### **35 U.S.C. § 103 Rejection of Claim 8**

Claim 8 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Solonitsyn, in view of Pilipenko and further in view of Applicants' alleged admitted prior art or U.S. Patent No. 7,264,182 to Richter et al. (hereinafter "Richter"). However, claim 8 is ultimately dependent on independent claim 1 and is patentably distinct as Solonitsyn, Pilipenko and Richter do not disclose use of bubbles applied externally to fibers by a fluid jet. Moreover, the Action indicates that the alleged admitted prior art "states that if the velocity is too low the pressure drop is too low, and that if the velocity is too high then pressure is too high." (Action, p. 9). However, this statement is provided without any citation as to where in the Goto et al specification it is found. Applicants vehemently deny that any such admission has been made as stated in the Office Action and request the withdrawal of the same as an admission.

### **35 U.S.C. § 103 Rejection of Claims 15-24**

Claim 15-24 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Solonitsyn, in view of Pilipenko and Smook.

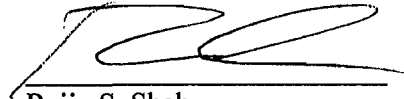
Solonitsyn discloses an apparatus that includes a tank, an effuse, a reactor, a pump and nozzles for introducing a chemical reagent to a suspension flow. As recognized in the Office Action, the Solonitsyn (and Pilipenko) reference fails to disclose a pressure control mechanism upstream from the nozzle. However, Smook is cited for disclosing a pressure control mechanism.

Smook's alleged pressure control mechanism is merely a control valve (*see* Smook, pages 357-359). The control valve is essentially an "on/off" switch to either open or close flow. Whereas, Applicant's apparatus incorporates a pressure control mechanism that includes one or both of a pressure detection mechanism and an outlet flow rate control mechanism. Even beyond this, Applicant's apparatus is one which includes, among its features, a baffle plate for regulating flow from the nozzle to the vessel outlet. None of Solonitsyn, Pilipenko or Smook discloses or suggests the pressure control mechanism or baffle plate.

Thus, independent claim 15 is believed to be patentably distinct over Solonitsyn, Pilipenko and Smook either alone or in combination. With respect to dependent claims 16-24, such are ultimately dependent on independent claim 15 and are patentably distinct for the same reasons as those claims.

Prompt and favorable examination on the merits is solicited.

Respectfully submitted,



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